? Ask Dr. ALOHA:

Using ALOHA Outside of the United States

Dr. Coumba NDiaye has recently been designated the emergency manager for the busy Port of Wuromaoudo, a large West African capital city. She recently obtained ALOHA and MARPLOT from the United Nations Environment Programme (UNEP), and has been familiarizing herself with the software. She quickly realized that ALOHA could be valuable for her contingency planning and response work. She recognizes that there's substantial potential for chemical accidents at her port. Vessels carrying potential air hazards often arrive at Wuromaodo, where the chemicals are transferred onto tankcars for rail shipment to inland processing facilities.

Dr. NDiaye especially likes the way that ALOHA and MARPLOT work together, allowing users to plot ALOHA footprints on electronic maps displayed in MARPLOT. There's just one sticking point: the ALOHA and MARPLOT manuals don't explain how to plot ALOHA footprints on electronic maps other than the standard MARPLOT maps, which cover only locations within the U.S. and its possessions. She wonders whether it's even possible for her to use a map of her city with MARPLOT and ALOHA.

Several Options Exist

In fact, if you, like Dr. NDiaye, are using ALOHA outside of the U.S. and would like to plot footprints on a map of your area in MARPLOT, you have at least three options (the third requires no electronic mapping expertise):

- If someone has a map of your area in ArcInfo (not ArcView) format, you can ask them to export the map file in ARC UNGENERATE format; you then can import the file into MARPLOT. To export the file, they'll need to use the "ungenerate" command and the following syntax: *ungenerate <line | poly | point> incover out_generate_file.* To import the file into MARPLOT, from MARPLOT's File menu, choose Import, then select the new map file. Exporting and importing map files are complicated tasks; if you are not an experienced ArcInfo and MARPLOT user, ask an expert for help.

- If you have a set of electronic map data that is not in ArcInfo format, you may be able to convert the data to ARC GENERATE, TIGER, or MARPLOT's MIE format, so that you can import it into MARPLOT. You can use the TIGER Translator, which comes with MARPLOT, to convert TIGER data into MARPLOT's MIE format. If you have access to the Internet, check the MARPLOT Technical Description, at http://response.restoration.noaa.gov/cameo/toolkit.html, to learn about converting data to MIE format.

- If you have a paper map, such as a map of your city, you can use a digital scanner to make an electronic copy of it, which you can use as a map in MARPLOT. Below are step-by-step directions for doing this.

Using a Scanned Map in MARPLOT

1. Scan in a map. Try to find a map that is about the scale that you will want to use for most of your projects (a scanned-in map will lose resolution when zoomed far in or far out). If your map is large, scan it in segments, and then make an electronic file out of each segment (you'll be able to work more effectively with a few smaller files in MARPLOT than with a single big file).

2. Save the map as a BMP file, if you're working on a PC, and as a PICT file if you're working on a Macintosh. (You may wish to reduce the color depth of your map file in order to reduce its file size [the amount of hard drive space it takes up]. As a rule of thumb, changing from 16-bit color depth [thousands of colors] to 8-bit color depth [hundreds of colors] usually will reduce file size by a factor of about four. A black-and-white graphic will be smallest in size.)

3. On the paper copy, find a point for which you can determine the latitude and longitude. This is Point 1. Find a second point that's a known distance away from the first point. This is Point 2.

4. In MARPLOT, from the List menu, choose Layer List. Click New to create a new "Basemap" layer. Click on the name of this layer in the Layer List, then, from the Move menu, select Bottom to move the Basemap layer to the bottom of the Layer List. Leave the Basemap layer unlocked (when a layer is unlocked, the little lock icon just to the left of its name in the Layer List appears to be unlocked [it otherwise appears to be locked]; whenever you wish to lock or unlock a layer, just click on its lock icon).

5. From the Edit menu, choose Insert Picture Object, then click Make New Map.[1]

6. Select your scanned map file.

7. Click Geo-Reference. You'll then see a special dialog box that shows part of your map, along with some controls.

8. Scroll the map, if necessary, until you can see Point 1. Use the zoom tool to zoom in for better accuracy, if you need to. Then click on Point 1.

9. Type in the latitude and longitude of Point 1.

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[1] The following steps are also shown in Section 5.5 of the MARPLOT User's Manual.

10. Click on Point 2 (scroll the map and/or use the zoom tool if necessary), then click Distance. Type in the distance between Point 1 and Point 2, choose the right units, and then click OK. Your new map should appear in the MARPLOT map window. To check your work, first click on Point 1, then look in the upper map margin to check whether the latitude and longitude are correct. Then use the distance tool to check that the distance between Point 1 and Point 2 is correct. If you find you've made a mistake, click on your map to select it, then choose Object Settings from the Objects menu, click Geo-Reference, and then redo your geo-referencing.

11. Relock the Basemap layer before you work with your new map (to do this, from the List menu, choose Layer List, then click on the lock icon next to the name of the Basemap layer).

Creating a Single Map From Several Smaller Map Segments

If you have scanned segments of a large map and have saved each as a separate BMP or PICT file, you can create a single map that includes all of these segments (MARPLOT will run better and faster using a map composed of segments than using a map that is a single, large file). To do this, first find two geo-referencing points on the paper copy of each map segment, as described above in step 3. Then,

1. For the first of your map segment files, just repeat steps 5 to 10 above to create a new map.

Once you've done this, you can add the remaining segments to the new map, as follows:

2. For each remaining map segment file, from the Edit menu, choose Insert Picture Object, then click Use Existing Map (*not* Make New Map!).

3. Select your file, then check that Layer has been set to Basemap (if not, click Set, then select Basemap). Check that Map has been set to the name of the map you just created (if not, click Set, then select that map).

4. Follow steps 7 to 10 in the preceeding section to geo-reference your map segment.

To make your segments line up exactly in the MARPLOT map window, you may have to nudge one or another (this may be necessary if you don't have exact latitude and longitude or distance values).

5. Once you have inserted all your map segments and have lined them up in the MARPLOT window, lock your Basemap layer.

Working With Your Map and ALOHA

Once you've created your map, you can work with it just as you would work with a standard MARPLOT map: you can add layers to your map on which you can place symbols or polygons representing facilities or populations of concern, such as schools and hospitals. To plot an ALOHA footprint on your map, first run ALOHA and create a footprint plot in ALOHA itself. Then, in MARPLOT, select the arrow tool from MARPLOT's toolbar, then click on the location of the release on the map. Finally, from MARPLOT's Sharing menu, from the ALOHA submenu, choose Set Source Point. The footprint will appear on your map, as in Figure 1 below.
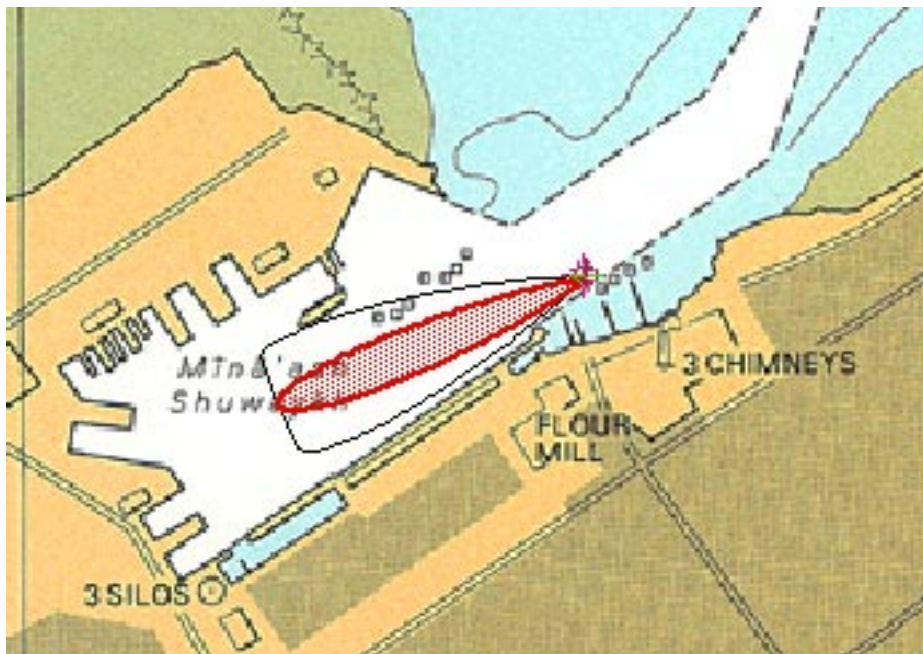

Figure 1. An ALOHA footprint displayed on a map in MARPLOT. This map was scanned from a paper copy, following the steps above.

If you then would like to see predicted concentrations in the air at ground level at a location of particular concern, while the footprint is displayed on your map, click on the location, then, from MARPLOT's Sharing menu, from the ALOHA submenu, choose Set Conc/Dose Point. Check the ALOHA and MARPLOT manuals for more information about working with a map in MARPLOT and using ALOHA with MARPLOT.

More ALOHA Resources

More resources are available to you if you're working with ALOHA outside of the U.S. and you have access to the Internet. First, you'll probably need to add your location to ALOHA's location library, which contains mainly information

about U.S. cities. To do this, you'll need to know your latitude and longitude as well as your approximate elevation (you can probably find all this information in a good print map atlas). You'll also need to know your GMT offset, which you can find at http://www.hilink.com.au/times/ . ALOHA needs this information to accurately estimate pool evaporation and to choose atmospheric stability class (which affects how a toxic cloud disperses in the atmosphere).

Second, you can access a variety of other ALOHA resources and information at the following page on the NOAA HAZMAT web site: http://response.restoration.noaa.gov/cameo/toolkit.html .

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